A new species of *Xyloperrisia* (Diptera: Cecidomyiidae), a stem gallmaker on *Maytenus boaria* (Celastraceae) from Argentina

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■ **ABSTRACT.** A new species of gall midge, *Xyloperrisia mayteni* Gagné, is described from twig galls of the tree, *Maytenus boaria* (Celastraceae), from Argentina. The damage made by the gall midge is severe enough to kill many branches in ornamental plantings. This gall midge is only the second species to be assigned to *Xyloperrisia* Kieffer, a genus otherwise known from a species forming galls on stems of *Pernettya furens* (Ericaceae).

KEY WORDS. Diptera. Cecidomyiidae. Celastraceae. Argentina. Galls.

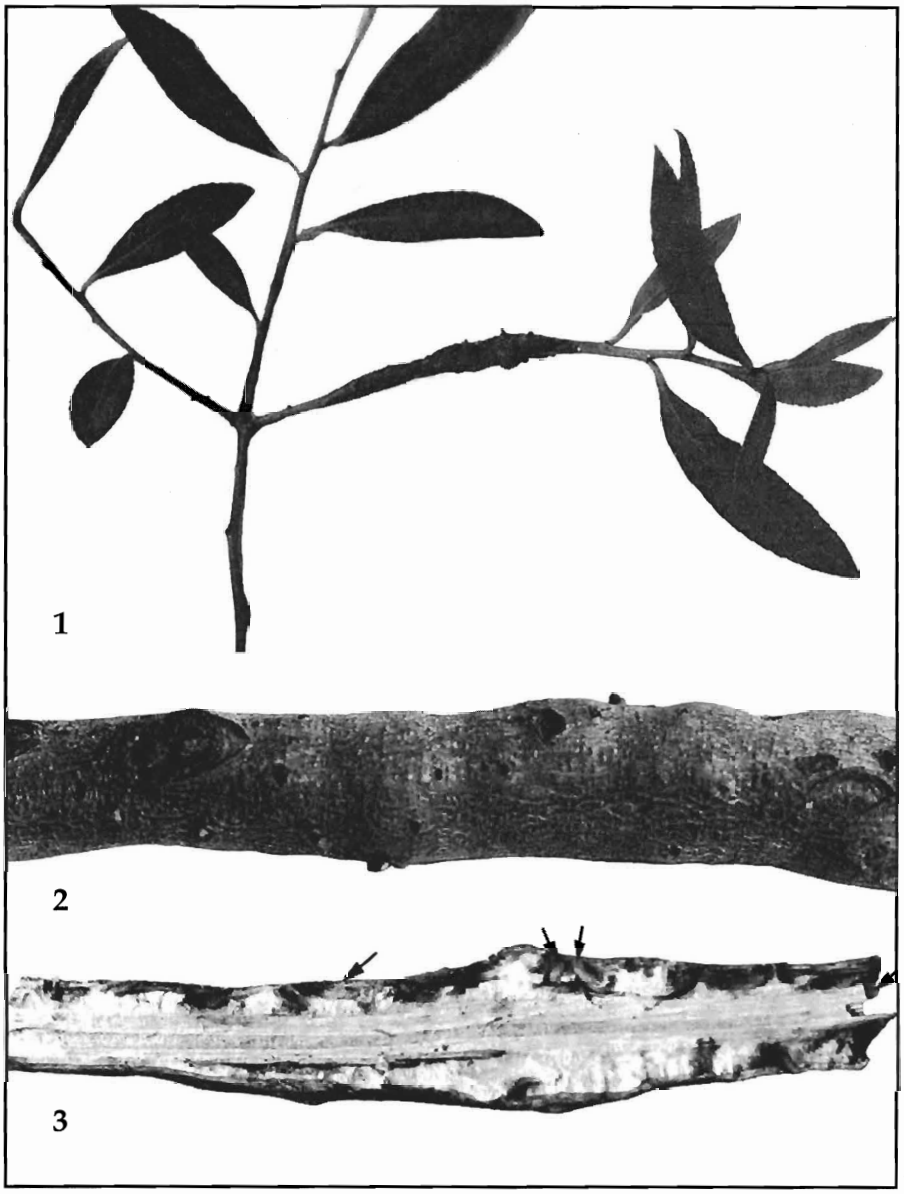
■ **RESUMEN. Una especie nueva de *Xyloperrisia* (Diptera: Cecidomyiidae), productora de agallas en ramas de *Maytenus boaria* (Celastraceae) en la Argentina.** Se describe a *Xyloperrisia mayteni* Gagné, una especie nueva de díptero productor de agallas en ramas de *Maytenus boaria* (Celastraceae), para la Argentina. El daño producido es suficientemente severo como para matar ramas en plantaciones ornamentales. Ésta es la segunda especie asignada a *Xyloperrisia* Kieffer, un género sólo conocido anteriormente por una especie productora de agallas en ramas de *Pernettia furens* (Ericaceae).

PALABRAS CLAVE. Diptera. Cecidomyiidae. Celastraceae. Argentina. Agallas.

INTRODUCTION

Maytenus boaria Mol. (Celastraceae) is an evergreen tree that is native to the Andean–Patagonian forests. Its rounded canopy makes the tree an attractive ornamental species in parks and gardens. The tree is planted extensively in Plaza Sarmiento in downtown San Martín de los Andes, Neuquén, Argentina. During the month of September 1999 many irregularly distributed dead branches were apparent in the canopy. Upon investigation all the dead branches exhibited elongated swellings with numerous perforations (Figs. 1-2). Longitudinal sections of the galled branches showed numerous full-grown, yellow larvae in galleries of the phloem and cambium (Fig. 3). These galleries evidently girdled the twigs, resulting in the death of the branches.

The gall midge larvae found inside were reared to the adult stage for identification and were found to belong to an undescribed species of Cecidomyiidae. Adults run to *Xyloperrisia* Kieffer in the key to Neotropical genera of gall midges in Gagné (1994). The genus is otherwise known from one species, *Xyloperrisia azarae* Kieffer. Larvae of *X. azarae* also form swellings in woody stems, but of *Pernettya furens* (Ericaceae) in Chile. Larvae and pupae of the two species are generally similar, and the adults differ in only a few genitalic differences. The types of *X. azarae* are presumed lost and the species has not been collected subsequently, but the original and subsequent descriptions in Kieffer (1903) and Kieffer & Herbst (1906) allow us to place the new species in *Xyloperrisia*.



Figs. 1-3. Galls on *Maytenus boaria*. 1, Branch with twig swelling (1x). 2, Swollen branch showing exit holes (3x). 3, Longitudinal section showing larvae of X. *mayteni* in cortex (3x).

METHODS

During the summer of 2000 (February), live, swollen branches were collected to observe the development of the gall and eventually obtain adults. Samples were taken both from specimen trees in town and wild plants in forests outside San Martín de los Andes. Monthly samples were taken from February to August 2000, biweekly samples during September and October 2000, weekly samples between November 2000 and January 2001, and again monthly from February to May 2001. The surroundings of San Martín de los Andes were watched for damage throughout the year.

In September and November 1999 the symptoms were noticed on only a few trees in Plaza Sarmiento, in young branches less than two years old. In May 2000 symptoms were observed outside of town in wild plants, and after September 2000 most of the trees in town and most of the trees outside of town showed signs of attack.

Galls with pupae or full-grown larvae were placed in small containers until adults emerged. Specimens of immature stages and reared adults were preserved in 70% ethanol. Samples were mounted on microscope slides using the method outlined in Gagné (1989). Terminology for adult morphology follows usage in McAlpine *et al.* (1981) and for larval morphology that in Gagné (1989). Galls were obtained, adults reared, and other stages secured by M. O. Gentili and P. Cueto. The taxonomic investigation is the responsibility of R. J. Gagné.

RESULTS

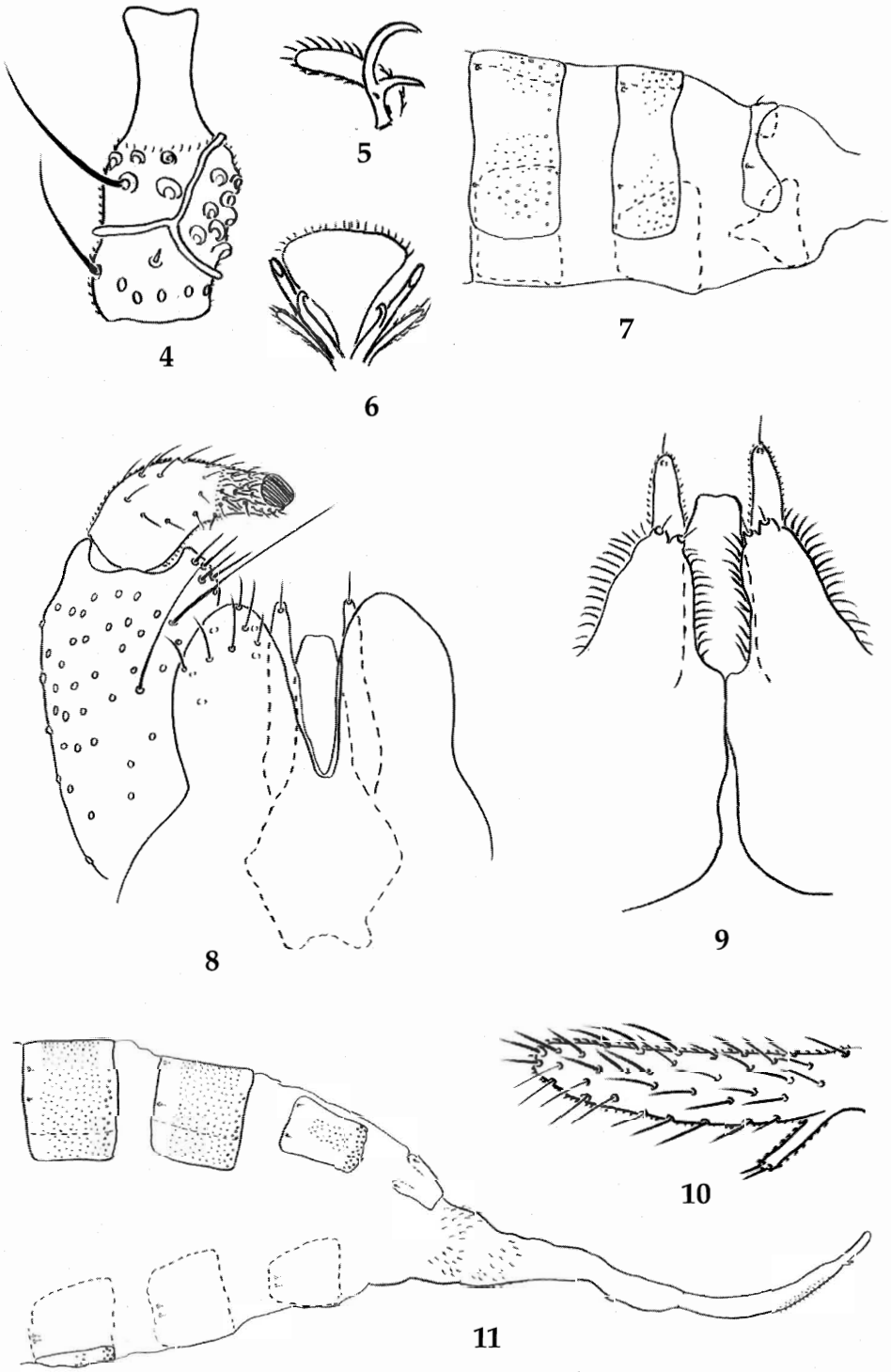
Xyloperrisia mayteni Gagné, new species
(Figs. 4-15)

Adult. *Head.* Eyes 6-7 facets long at vertex, separated by width of 1-2 facets; facets rounded, almost touching ventrally and dorsally, up to 1 facet apart at midheight. Frons with 26-38 setae. Labella hemispherical, bearing several apical and lateral setae. Palpus 4-segmented, first segment 1/3 to 1/2 length second, the remainder subequal in length, the fourth narrower than the preceding. Male antenna with 15-16 flagellomeres (Fig. 4), all except distalmost with long necks. Female antenna with 15 flagellomeres, without necks. *Thorax.* Wing uniformly hyaline, 3.0-3.3 mm long in males (n=4) 2.6 mm in female (n=1); R_5 slightly sinuous, curved toward apex to join C at wing apex; M_{3+4} fold present, Cu forked. Tarsal claws (Figs. 5-6) with basal tooth, curved beyond midlength; empodia flattened, widened apically, slightly longer than claws, swept posteriorly; pulvilli about 1/2 length of claws. *Male abdomen* (Figs. 7-9). First through seventh tergites entire, rectangular, with mostly single posterior row of setae that is interrupted medially, a pair of anterior trichoid sensilla, and otherwise mostly covered with scales except medially; sixth and seventh tergites have in addition several lateral setae; seventh tergite slightly shorter than sixth. Eighth tergite reduced in size, with anterior pair of trichoid sensilla the only vestiture. Second through seventh sternites rectangular, covered with setae, with 2 closely adjacent anterior trichoid sensilla; eighth sternite similar to preceding except shorter and triangular. *Genitalia* (Figs. 8-9). Cerci broadly rounded and with setae on both surfaces posteriorly; hypoproct as long as cerci, deeply lobed, the lobes narrow, each terminated with single seta; aedeagus shorter than hypoproct, blunt tipped, without sensoria; claspettes shorter than aedeagus, with short apical setae situated on lobes and elsewhere covered with long setulae; gonocoxite robust, cylindrical, covered with setae; gonostylus short, widest at base, with scattered setae, setulose except near ridges present anterior to apical tooth. *Female abdomen* (Figs. 10-11). First through seventh tergites entire, rectangular, with single to double posterior row of setae interrupted medially, no lateral setae, a pair of anterior trichoid sensilla, and otherwise mostly covered with scales; seventh tergite longer than wide, much narrower than preceding tergites. Eighth tergite weakly sclerotized, slightly smaller than seventh, without vestiture except for anterior pair of trichoid sensilla. Second through seventh sternites rectangular, covered with setae, with two closely adjacent anterior trichoid sensilla; eighth sternite similar to preceding except narrower and trapezoid. Ovipositor protrusible, long and attenuate; extended eighth segment with scattered setae; ninth segment covered with short setae ventrally on distal half; cerci fused (Fig. 10), elongate-cylindrical, covered with setae; hypoproct cylindrical with two apical setae.

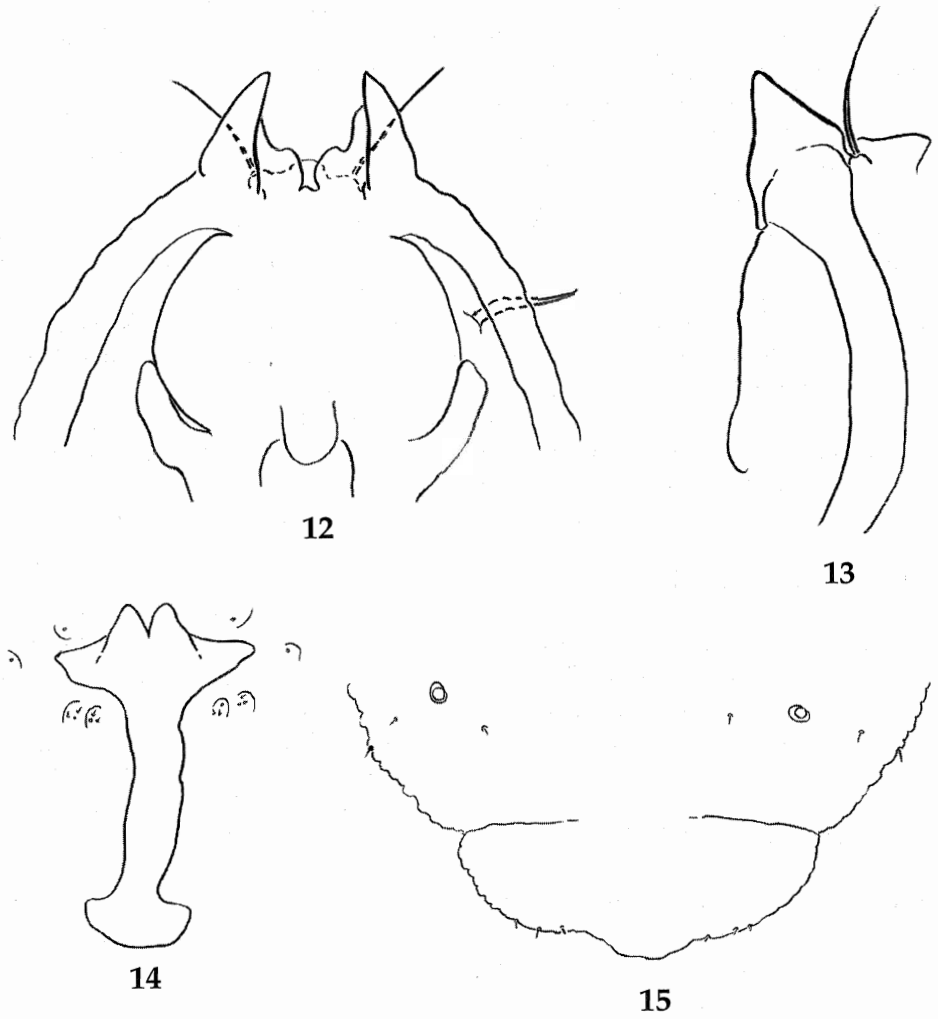
Pupa (Figs. 12-13). Antennal base extended apically, strongly sclerotized, ventral edge sharp, apex pointed. Cervical sclerite with two elongate setae. Face without ventral projections or papillae. Prothoracic spiracle elongate, pointed apically. Abdominal tergites covered anteriorly through most of length with uniformly small spicules, none enlarged and spiniform.

Third larval instar (Figs. 14-15). Length, 2.5-3.0 mm. White. Integument covered with rounded verrucae. Antenna about twice as long as wide. Spatula dark brown, with 2 anterior teeth, wide antero-lateral extensions, and long shaft. Full complement of Lasiopteridi papillae present (cf Gagné 1994), but setae short. Terminal segment rounded, the eight papillae setiform, short.

Holotype. ♂, from *Maytenus boaria*, Argentina, Neuquén Prov., San Martín de los Andes, M. Gentili and P. Cueto, deposited in the National Museum of Natural History (USNM), Washington, DC, U.S.A.



Figs. 4-11. *Xyloperrisia mayteni* n.sp. 4, Male third antennal flagellomere. 5, Tarsal claws, empodium, and pulvilli (lateral). 6, Same (ventral). 7, Male abdomen, sixth through eighth segments (dorsolateral). 8, Male genitalia, only one gonopod shown, claspettes obscured (dorsal). 9, Claspettes, aedeagus and apices of hypoproct (ventral). 10, Female cercus, detail (lateral). 11, Female abdomen, fifth segment to cerci (dorsolateral).



Figs. 12-15. *Xyloperrisia mayteni* n.sp. 12, Pupal head and thoracic features (ventral). 13, Same (lateral). 14, Larval spatula and adjacent papillae (ventral). 15, Larval terminal segments (dorsal).

Other material examined (all deposited in USNM). Same data as holotype, 4♂, &, 6 pupae, 12 larvae.

Etymology. The specific name, *mayteni*, means "of *Maytenus*."

Taxonomy. *Xyloperrisia* Kieffer (1913) was described for *Perrisia azarae* Kieffer (1903), reared from stems of *Pernettya furens* (Ericaceae) in the vicinity of Concepción, Chile. The types of *P. azarae* are presumed lost, but the new species fits the genus as described in the following characters: the adult has a four segmented palpus, toothed claws, a deeply divided hypoproct with narrow lobes, and fused female cerci; the pupa has strongly developed antennal horns and lacks large dorsal abdominal spines; the larva has a strongly sclerotized, robust spatula (similar to that in Kieffer & Herbst (1906): 230, fig. 5 for *X. azarae* [as *azarai*]) and has a similar feeding niche in the stem cortex. The pupal antennal horns and the well-developed larval spatula are modifications often found in gall midges of several taxa that live in wood (Gagné 1994), so these could well be unrelated adaptations in these two species.

Differences between the two species include: the shorter necks of the male flagellomeres in *X. azarae* that are reportedly not longer than wide but which are definitely longer than wide in *X. mayteni*; the male gonostylus of *X. azarae* that is thickest at midlength and about 2/3 the length of

the gonocoxite, while in *X. mayteni* the gonostylus is thickest at the base and only about half the length of the gonocoxite; female cerci not much longer than wide in *X. azarae*, but at least twice as long as wide in *X. mayteni*. The genitalic differences serve to separate the two species, although a more definite evaluation of whether the two should be congeneric can be made only when *X. azarae* is rediscovered.

Biology. Eggs are red, elongate–ovoid, with elongate tips and were found in November in crevices in groups of less than 10. Larvae hatch by the end of November. By mid–December chambers begin to form in the twigs. Larvae continue to grow and the chambers continue to elongate until the following October, when pupation begins. By October the ends of the larval chambers approach very closely the external wall of the branch. When adults inside the pupae are fully formed, the pupae force a hole through the remaining branch tissue, partly extrude themselves, and the adults break through the pupal thorax to emerge. Adults fly in October–November.

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